ITEC 176: ADV PROG LOGIC CONTROLLERS

Proposer:

Name:	Email:
Travis Asher	travisa@cos.edu

Effective Term:
Fall 2024

Credit Status:
Credit - Degree Applicable

Subject:
ITEC - Industry and Technology

Course Number:
176

Discipline:

And/Or	(	Discipline	)
		Industrial Technology	

Catalog Title
Advanced Programmable Logic Controllers for Industrial Automation

Catalog Description
Advanced course in the function and application of programmable logic controllers. Topics covered include arrays, analog and digital I/O configuration, memory organization, data manipulation, sequencer functions, math instructions, array instructions, subroutines, programs, tasks, produce/consume tags, load cells and weigh scales, remote I/O, and networked applications.

Prerequisites
ITEC 174, ITEC 182, ITEC 184 and ITEC 283 or equivalent college courses with a minimum grade of C

Corequisites
ITEC 285, ITEC 279, and ITEC 287 must be taken concurrently

Validation
Validation Type
Sequential - Same Discipline

Course
ITEC 174

Validation Type
Sequential - Same Discipline

Course
ITEC 182

Validation Type
Sequential - Same Discipline

Course
ITEC 184

Validation Type
Sequential - Same Discipline

Course
ITEC 283

Validation Type
Sequential - Same Discipline

Course
ITEC 287

Validation Type
Sequential - Same Discipline

Course
ITEC 279

Validation Type
Sequential - Same Discipline

Course
ITEC 285

Complete the Prerequisite/Corequisite Objectives and provide sound quantitative research to document the need for the requisite.

Method of Instruction:
Distance Education (Emergency Addendum)
Laboratory
Lecture and/or Discussion

Course Units/Hours:

Course Units Minimum:
4

Lecture Hours Minimum (week)
3

Lab Hours Minimum (week)
3

Total Contact Hours Minimum (semester)
105

Total Outside Hours Minimum (semester)
105

Total Student Learning Minimum Hours (semester)
210

Repeatability:
No

Open Entry/Exit:
No

Field Trips:
Not Required

Grade Mode:
Standard Letter

TOP Code:
095600 - * Manufacturing and Industrial Technology

SAM Code:
B - Advanced Occupational

Course Content

Methods of Assessment:

Mulitple choice tests
Problem solving assignments or activities
Skill demonstrations

Course Topics:

	Course Topics
1	Advanced programming instructions for file/array manipulation, shift registers, sequencers, compare instructions, program control, subroutines, programs, tasks, and produce/consume tags, load cells and weigh scales, remote I/O, and ControlLogix hardware platform.
2	Communication software configuration required to establish a connection between the PLC and programming software.
3	Analog I/O configuration and continuous measurement of process variables.
4	PLC system troubleshooting techniques and documentation practices.

Course Objectives:

	Course Objectives
1	Understand and explain the I/O configuration of a PLC project based on observations of the application's software and hardware configuration.
2	Troubleshoot the operation of a programmable logic controller.
3	Write programs to successfully affect the operation of programmable logic controller using both digital and analog I/O.

Course Outcomes:

	Course Outcomes
1	Successfully create ladder logic programs to control an automated process using hardware and software used in the industry.
2	Successfully configure communication software to establish a connection between the controller and programming software.
3	Understand and explain the necessary program configuration and electrical wiring for monitoring and controlling digital and analog I/O devices.

Assignments:

Assignment Type:	Details
Reading	Students will read assigned sections and chapters of the course textbook in preparation for class discussions and lectures.
Writing	Students will answer questions from text book, write summaries of lab projects, provide written answers for exams, and calculate answers for exam questions.

Homework	1. Students will answer chapter questions from text book. 2. Students will be given reading assignments in text. 3. Students will be given programming applications to be accomplished at home. 4. Students will conduct Internet research about existing programs. 5. Students will be given problems to solve by applying programming techniques.
Lab	Students will complete PLC wiring and programming lab exercises to provide hands-on experience and reinforcement of concepts discussed in lecture.

Textbooks or other support materials

Resource Type:	Details
Books	Introduction to the ControlLogix Programmable Automation Controller with Labs 2nd Edition, Gary Dunning, ISBN: 978-1111539290

Equity Review:

No

Transferable to CSU

Yes - Approved

CSU General Education

Transferable to CSU

Other Degree Attributes

Degree Applicable
Not a Basic Skills Course

Additional Attachment

ITEC 276 Outcomes.pdf
ITEC276-DLA.pdf

Banner Title:

Adv Prog Logic Controllers

Course Control Number:

CCC000633568